REMARKS

Favorable reconsideration of this application is requested in view of the foregoing amendments and the following remarks. Claims 1-11, 15 and 25-39 are pending in this application. Claims 12-14, 16-24 and 27 were previously canceled without prejudice or disclaimer. Claims 35-37 were previously presented. Claims 38-39 are newly presented.

The claims are amended in order to more clearly define the invention, support for which is found in the figures and related parts of the specification. Specifically, support for the limitation of wherein two of the of plurality of direct-sequence spread-spectrum signals, independent of their relative starting phases, will integrate to zero is found in the paragraph bridging pages 14-15 and the first full paragraph of page 15. Support for the limitation of an integration time to define orthogonally is 1/Tb, where 1/Tb is a data rate is found in the paragraph bridging pages 14-15. Support for new claims 38-43 is found in the paragraph bridging pages 14-15 of this application as originally filed. Support for new claims 44-49 is found at page 13, lines 5-7.Claims 1, 7, 10, 28 and 32-34 stand rejected under 35 USC 103 as in view of Jung-yeol Oh et al. ("The bandwidth efficiency increasing method of multi-carrier CDMA and its performance evaluation in comparison with DS-CDMA with rake receiver", Vehicular Technology Conference, May 16-20, 1999, Pg. 561-565) (hereinafter Oh) in view of Dent (U.S. Pat. No. 5,351,016).

First, Oh does not disclose or suggest overlapping a plurality of direct-sequence spread-spectrum signals using carrier frequencies that are each precisely an integer multiple of a bit rate. Oh's symbol rate is the effective channel modulation rate and not the claimed bit rate which is the original data rate (not to be confused with the spread-spectrum chipping rate). The OFDM component of Oh must have orthogonal carrier spacings equal to multiples of the direct sequence (Walsh-coded) chipping rate [see Fig.3, p.562 of Oh] (not to be confused with the

original channel data rate prior to spread-spectrum modulation). Thus, Oh's OFDM carrier frequency spacings are according to the Walsh-coded direct-sequence chipping rate (which is much greater than the original bit rate, by the factor of the direct-sequence Walsh polynomial length.

Second, Oh does not disclose or suggest overlapping a plurality of direct-sequence spread-spectrum signals using carrier frequencies that are orthogonally spaced relative to an integral multiple of the bit rate rather than a chip rate, where the chip rate is an integer multiple of the bit rate and is greater than or equal to two. Based on the terminology used by Applicants in the specification as originally filed (and as specifically depicted in figure 1), the bit time period includes multiple chip time periods and therefore, the bit rate is slower than the chip rate. At lines 14-16, page 3 of the Office Action, the Examiner acknowledges that Oh does not disclose that the chip rate is an integer multiple of the bit rate and it greater than or equal to two.

Dent discloses a method and apparatus for a high-accuracy, self-adjusting quadrature modulator and related method for use in commercial CDMA systems. However, Dent does not at any point teach the use of multiple carrier frequencies, but rather limits his discussion to a single frequency channel with multiple CDMA signals received simultaneously therein [see Fig. 3 and Column 2, lines 4-47 of Dent]. Therefore, Dent does not disclose or suggest the use of multiple overlapping direct sequence signals with carrier frequencies separated by a base bit rate rather than the full channel chipping rate, as specified by the claimed invention. Therefore, Oh in view of Dent does not in any way disclose or suggest the current invention.

Accordingly, withdrawal of this rejection is respectfully requested.

Claims 2-3, 6,29 and 36 were rejected under 35 USC 103 as obvious in view of Oh in view of Dent (U.S. Pat. No. 5,351,016) and further in view of Li Enjia et al. ("The study of FH/MCFD/SSMA/DPSK wireless communications system", International Conference on

Communications Technology, ICCT'98, Oct. 22-24, 1998, Pg. S18-06-1 – S18-06-5);

(hereinafter Enjia).

Enjia does not obviate the above-discussed deficiencies of Oh and Dent. Enjia teaches

the need for mathematical sequence orthogonality in spread-spectrum systems, but not the use

of bit-rate spacing of the carriers {see page 2, lines 4-10 of Enjia]. In the system of Enjia, the

multiple carriers of the transmitted signal are not specified as to their mutual frequency spacing.

Since the claimed invention specifies carrier spacing at the bit rate (much smaller than the chip

rate), Oh in view of Dent in view of Enjia does not disclose or suggest the claimed invention.

Accordingly, withdrawal of this rejection is respectfully requested.

Claims 4 and 9 were rejected under 35 USC 103 as obvious in view of Oh in view of Dent

(U.S. Pat. No. 5,351,016) and further in view of Haines (5,469,469) (hereinafter Haines).

Haines does not obviate the above-discussed deficiencies of Oh and Dent. Haines fails

to teach the use of frequency-orthogonal carriers at all. Rather, Haines uses time-orthogonal

subcarriers (e.g., I and Q quadrature carriers, separated by 90 degrees in phase (or time)). At no

point does Haines disclose the use of multiple or orthogonally spaced frequencies. Haines does

teach the use of standard-art frequency-shift keying (FSK) modulation and mentions linear

continuous-phase modulation (CPM) [see column 3, lines 17-25 of Haines]. However, CPM is

limited to phase shifts of ±180 degrees at a fixed center frequency. This is not the same function

as a continuous-phase frequency hop of the current case, which requires that the waveform

have a continuous phase (i.e., no interruptions) even during large changes in carrier frequency.

Therefore, Oh in view of Dent in view of Haines does not disclose or suggestion the claimed

invention.

Accordingly, withdrawal of this rejection is respectfully requested.

Claims 5, 30-31, 35 and 37 stand rejected under 35 USC 103 as obvious in view of Oh in

view of Dent (U.S. Pat. No. 5,351,016) and further in view of Azad ("Multirate Spread Spectrum

Direct Sequence CDMA techniques", IEE Colloquium on Spread Spectrum Technique, 15 April, 1994, Pg. 4/1 – 4/5) (hereinafter Azad).

Azad does not obviate the above-discussed deficiencies of Oh and Dent. Azad does not teach or suggest the use of bit rate spaced frequency-overlapped direct sequence signals as required by the claimed invention. Although Azad discloses a TDM/CDMA signal wherein a data frame is divided into several time slots [TDM/CDMA, p. 4/2, lines 1-11 of Azad], this conventional TDM or time-slotting process has predetermined or fixed intervals and is not the same as the time-hopping required by claims 5, 30-31, 35 and 37 because these dependent claims require all the limitations of their respective independent base claims. Therefore, Oh in view of Dent in view of Azad does not disclose or suggestion the claimed invention.

Accordingly, withdrawal of this rejection is respectfully requested.

Claims 8, 15 and 25-26 stand rejected under 35 USC 103 as obvious in view of Oh in view of Dent (U.S. Pat. No. 5,351,016) and further in view of Yun (6,243,397) (hereinafter Yun).

Yun does not obviate the above-discussed deficiencies of Oh and Dent. Yun teaches only the use of existing-art, conventional symbol-spread orthogonal carrier spacing (as OFDM) at the chipping rate [see Fig. 3a of Yun]. Yun never mentions or even hints at the use of (pre-spreading) bit-rate spacing for these signals, as required by the claimed invention. Therefore, Oh in view of Dent in view of Yun does not disclose or suggestion the claimed invention.

Accordingly, withdrawal of this rejection is respectfully requested.

Claim 11 stands rejected under 35 USC 103 as obvious over Oh in view of Dent (U.S. Pat. No. 5,351,016) and further in view of Natali (5,623,487) (hereinafter Natali).

Natali does not obviate the above-discussed deficiencies of Oh and Dent. Natali discloses a system employing multiple CDMA carriers [see Column 1, lines 62-66 of Natali] which are mutually spaced at multiples of the chipping rate, not the original bit rate as required by the claimed invention. Therefore, Oh in view of Dent in view of Natali does not disclose or

suggest the claimed invention, where the transmitted carriers are spaced at <u>integer multiples</u> of the original <u>bit rate</u>.

Accordingly, withdrawal of this rejection is respectfully requested.
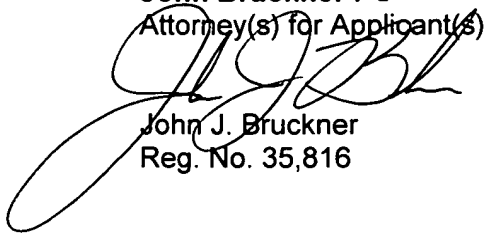
Other than as explicitly set forth above, this reply does not include acquiescence to statements, assertions, assumptions, conclusions, or combination thereof in the Office Action. In view of the above, all the claims are considered patentable and allowance of all the claims is respectfully requested. The Examiner is invited to telephone the undersigned (at direct line 512-394-0118) for prompt action in the event any issues remain that prevent the allowance of any pending claims.

In accordance with 37 CFR 1.136(a) pertaining to patent application processing fees, Applicant requests an extension of time from December 21, 2005 to February 21, 2006 in which to respond to the Office Action dated May 6, 2004. A notification of extension of time is filed herewith.

The Director of the U.S. Patent and Trademark Office is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 50-3204 of John Bruckner PC.

Respectfully submitted,

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